AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)

2. (Previously presented) The method of claim 17 wherein said nanoparticles comprise at least one of the following: C, Si, Ge, CuCl, CuBr, CuI, AgCl, AgBr, AgI, Ag_2S, CaO, MgO, ZnO, $Mg_xZn_{1-x}O$, ZnS, HgS, ZnSe, CdS, CdSe, CdTe, HgTe, PbS, BN, AlN, GaN, $Al_xGa_{1-x}N$, GaP GaAs, GaSb, InP, InAs, $In_xGa_{1-x}As$, SiC, $Si_{1-x}Ge_x$, Si_3N_4, ZrN, CaF_2, YF_3, Al_2O_3, SiO_2, TiO_2, Cu_2O, Zr_2O_3, ZrO_2, SnO_2, YSi_2, $GaInP_2$, Cd_3P_2, Fe_2S, Cu_2S, $CuIn_2S_2$, MoS_2, In_2S_3, Bi_2S_3, $CuIn_2Se_2$, In_2Se_3, HgI_2, PbI_2 and their various isomers and alloys.

3. (Previously presented) The method of claim 17 wherein said nanoparticles are in spherical, cubical, rod-like, tetragonal, single or multi-wall nano-tube or other nano-scale geometric shapes.

4. (Previously presented) The method of claim 17 wherein said nanoparticles are immersed in polymer matrix or other chemicals.

5. (Previously presented) The method of claim 17 wherein the nanoparticles are doped with other elements.

6. (Previously presented) The method of claim 17 wherein the nanoparticles are coated with other semiconductors or chemicals.

7. (Previously presented) The method of claim 17 further including using said bleachable enhancement layer to create images or patterns with higher resolution than the diffraction limit allows.

8. (Previously presented) The method of claim 17 further including separating photo-generated electrons and holes in said nanoparticles.

9. (Previously presented) The method of claim 17 further including providing carrier accepting surface states in said nanoparticles.

10. (Previously presented) The method of claim 17 further including providing chemical surfactant at the surface of said nanoparticles.

11. (Previously presented) The method of claim 17 wherein said nanoparticles comprise plural types of nanoparticles with different band-gaps.

12. (Previously presented) The method of claim 17 wherein said nanoparticles have a bandgap, and the method further includes providing, at the surface of said nano-particles, a semiconductor coating with a band-gap different from the band-gap of said nanoparticles .

13. (Previously presented) The method of claim 17 wherein said nano-particles include a n-type nano-particle within a p-type polymer matrix.

14. (Previously presented) The method of claim 17 wherein said nanoparticles comprise at least one p-type nanoparticle within an n-type polymer matrix.

15. (Previously presented) The method of claim 17 wherein said nanoparticles comprise n-type nano-particle or p-type nano-particles in a non-doped polymer matrix.

16. (Previously presented) The method of claim 17 further including inducing Auger recombination of multiple electron and hole pairs in said nano-particles.

17. (Currently amended) A method of exposing a semiconductor wafer having at least a photoresist thereon, said method comprising:

disposing photoresist onto the surface of a semiconductor wafer;

providing, on top of said photoresist, a contrast enhancement layer comprising a reversible photo bleachable material including nanoparticles;

providing a light source;

passing light from said light source through at least one mask;

collecting said light passing through said at least one mask and creating at least one light pattern on said photoresist;

~~a contrast enhancement layer comprising a reversible photo bleachable material including nanoparticles;~~

~~illuminating said photoresist with at least one light pattern;~~ said light pattern or light patterns at least in part photobleaching said contrast enhancement layer ~~in response to said illuminating;~~, said nanoparticles providing at least part of said photobleaching; ~~and~~

said at least one light pattern exposing said photoresist after passing through said contrast enhancement layer~~changing the solubility of said photoresist at least in part in response to said bleaching~~.

18. (Previously presented) The method of claim 17 wherein said providing comprises applying a reversible contrast enhancement layer (R-CEL) including nano-particles on said photoresist, and said illuminating includes passing incident light through said nano-particle layer before it reaches at least part of said photoresist.

19. (Original) The method of claim 17 wherein said illuminating comprises providing multiple exposures separated in time.

20. (Original) The method of claim 19 further including allowing said R-CEL to relax between at least some of said multiple exposures.

21. (Original) The method of claim 17 wherein said illuminating comprises providing multiple different exposure patterns separated in position on said substrate.

22. (Original) The method of claim 21 further including allowing said nano-particles to relax between at least some of said multiple exposures.

23. (Original) The method of claim 17 wherein said illuminating step comprises using a programmable mask.

24. (Original) The method of claim 23 further including reprogramming said programmable mask to provide at least first and second different exposure patterns, and allowing said nano-particles to at least partially relax after exposure with said first pattern and before exposure with said second pattern.

25. (Original) The method of claim 17 wherein said illuminating step comprises using multiple fixed masks.

26. (Original) The method of claim 17 wherein said exposing process is carried out in liquid-immersion or solid-immersion.

27. (Original) The method of claim 17 wherein said providing mechanism includes spinning, spraying, rinsing, dipping, precipitation, evaporation and other thin-film deposit mechanisms.

28. (Original) The method of claim 17 wherein said reversible photo bleachable material comprise plural different types of nano-particles.

29. (Original) The method of claim 17 wherein said reversible photo bleachable material comprise multiple layers containing nano-particles.

30. (Cancelled).

31. (Cancelled).

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

35. (Cancelled).

36. (Previously presented) The method of claim 17 further including further processing said photoresist to at least in part define at least one structure on said semiconductor wafer.

37. (Previously presented) The method of claim 17 further including reversing said bleaching of said contrast enhancement layer.

38. (Previously presented) The method of claim 17 further including tuning the absorption edge of said nanoparticles by specifying the size of said nanoparticles.

39. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 365 nm or shorter.

40. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 193 nm.

41. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 248 nm.

42. (Previously presented) The method of claim 17 wherein said illuminating comprises illuminating said layer with light having a wavelength of 157 nm.

43. (Previously presented) The method of claim 17 further including using said nanoparticles to resolve light distribution with high spatial frequency.

44. (Previously presented) The method of claim 17 wherein said nanoparticles comprise semiconductor nanoparticles.

45. (Previously presented) The method of claim 17 wherein said nanoparticles include Aluminum Nitride nanoparticles.

46. (Previously presented) The method of claim 17 wherein said nanoparticles include Aluminum Nitride alloys.

47. (Previously presented) The method of claim 17 wherein said nanoparticles include Aluminum Nitride isomers.

48. (Previously presented) The method of claim 17 wherein said nanoparticles have electronic structures exhibiting a band-gap.